Durometer Clinical Protocol

(Note: durometer measurements are to be taken after photographs and before Jeltrate mold)

1. **Patient positioning:**
   - Position the patient so that the affected area is horizontal to the floor, if possible.
   - Remove the wound dressing from the pressure ulcer or repair.
   - Make a note of patient positioning in the chart for consistency between measurements.
2. **Durometer preparation:**
   - Attach the big foot to the bottom of the durometer. Always use the durometer with the "big foot" attached. The foot of the durometer must be in full contact with the skin to get an accurate measurement. Increasing the diameter of the foot (by attaching the "big foot") reduces the amount of variation introduced by the user when taking the measurement (for the same reason that by pushing on a soft surface with your finger you can vary the pressure more than by pushing on that surface with the flat of your hand.)*
   - Attach the "Constant Load Weight" to the top of the durometer for taking readings on horizontal surfaces or surfaces that are up to 15 degrees off horizontal.
   - Pull the latex finger over the "big foot" and the shaft of the durometer so that no part of the durometer comes in contact with the patient when taking the measurements. The latex finger should remain loose around the bottom of the durometer so that it does not push up the indenter tip. If the latex finger is stretched too tightly over the indenter tip on the bottom of the durometer, the gauge will read higher than it should. To check the application of the latex finger, take a reading on your arm without the latex finger, then pull the finger over the bottom of the durometer and take another reading in the same spot on your arm. The two readings should be within five points of each other. If they are not, check to see if the latex finger is stretched too tightly over the indenter tip at the bottom of the durometer.
   - If the surface of the skin is more than 15 degrees off horizontal, remove the constant load weight before taking the measurement.

3. Durometer placement:

- Place the durometer (with big foot attached) onto the patient's skin with the edge of the big foot as close to the wound margin or incision as possible in the following manner:

  - **Chronic wound**. Placement should be at 3, 6, 9, and 12 o'clock positions around the wound margin. 12 o'clock should line up with the patient's head; 6 o'clock, the patient's feet.

  - **Post-operative wound**.
    (1) Proximal (near the attachment end),
    (2) Distal (most distant point from attachment),
    (3) Right (in relation to attachment end)
    (4) Left (in relation to attachment end)
    Right and Left are two points on the outside of the incision that are perpendicular to the line connecting the proximal and distal points. If the flap is unusually shaped, estimate points and draw a picture in the chart or in your notes to help ensure consistent placement in future visits.

4. Durometer measurement:

- If the surface of the skin is more than 15 degrees off horizontal, remove the constant load weight before taking the measurement.
- After correct placement, take one measurement by pressing down and holding the gauge in a near vertical position until the entire foot is in contact with the skin. The dial hand gives readings in durometer points.
- Return the durometer to a vertical position between each reading to reset the gauge.
- Take one reading in each of the four placement positions and repeat the procedure two more times so that a total of three measurements are taken at each point (i.e., avoid taking all three measurements in the 3 o'clock position, then taking all three in the 6 o'clock, etc. to allow the skin to return to normal at each placement point between measurements).
- Record the 3 measurements taken at each placement point on the Data Collection Form. Later you will enter the average of these three readings into the Access database. The three readings at each point should be within ± 2 points of each other. If one of the readings is a lot higher or lower than the other two, discard that reading and take a fourth reading to replace it. For example, if the first reading is 48, the second 50, and the third 60, discard the reading of 60 and take another reading to replace it.

5. **Post measurement tasks.**
    - Remove the latex finger from the end of the durometer and discard.
    - Enter the average of the three durometer readings recorded on the Data Collection Form into the Access database on the laptop for each durometer placement point.
    - For chronic wounds, enter the average of the three readings taken at each of the four positions: the 3 o'clock, 6 o'clock, 9 o'clock, and 12 o'clock positions. For post-op patients, enter the average of the three readings taken at each of the four positions: the proximal, distal, right, and left positions. For example, if the three readings are 48, 50, and 52, enter 50 into the Access database for that placement point.

*****One of the most common problems durometer users experience is false readings due to pressing too firmly on the gauge and imbedding the foot of the gauge into the soft tissue. To make Rex durometers a good instrument for measuring in hard to reach areas, they designed the gauges with the smallest foot possible, which is ½ inch in diameter. This small foot makes it easy for an inexperienced user to imbed the foot of the gauge into soft tissue, thus obtaining false readings. One simple way to prevent this operator error is to install a Big Foot attachment onto the lower barrel of the gauge. This Big Foot increases the diameter of the foot from ½ inch to 1 3/8 inches in diameter, which makes it nearly impossible for the user to imbed the foot into the tissue.

Use of Durometer for Measuring Hardness

The durometer is an engineering instrument widely employed to measure the hardness of metals, plastic, and other substances. The durometer has a calibrated gauge that registers linearly the relative degree of hardness of various substances. The gauge is spring-loaded and senses hardness by application of an indentation load on the specimen. At the bottom of the durometer there is a small dull inferior indentor that is retractable and is responsible for the measurements registered on the gauge. Placing the durometer on a hard flat surface, such as formica, registers a reading of 0.